The Ohio State University Bulletin

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APPLIED OPTICS

1919-1920

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UNIVERSITY CALENDAR

1919

Summer Session, Monday, June 23 to Friday, August 15.
Entrance examinations, Tuesday to Saturday, June 24 to 28, 8 A. M.
Entrance examinations, Tuesday to Saturday, September 9 to 13, 8 A. M.
Registration Day—First Semester—Tuesday, September 16.
President's Annual Address, Wednesday, September 17, 11 A. M.
Latest date for registration of candidates for a degree at the Commencement in June, 1920, October 1.
Registration Day, Short Courses in Agriculture—First Term—Tuesday, October 14.
Mid-semester reports to the Deans concerning delinquent students, Wednesday, November 19.
Thanksgiving recess begins November 26, 1 P. M., and ends December 2, 8 A. M.
Christmas recess begins Friday, December 19, 6 P. M.

1920

Christmas recess ends Tuesday, January 6, 8 A. M.
Registration Day, Short Courses in Agriculture—Second Term—Tuesday, January 6.
Final examinations, Wednesday, January 21 to Thursday, January 29.
Farmers' Week, Monday, January 26 to Friday, January 30.
First semester ends Thursday, January 29, 6 P. M.
Registration Day—Second Semester—Tuesday, February 3.
University Day, Saturday, February 21.
Close of Second Term, Short Courses in Agriculture, Friday, March 12.
Mid-semester reports to the Deans, Saturday, March 21.
Easter recess, Thursday noon, April 1 to Tuesday, April 6, 8 A. M.
Competitive Drill—Cadet Regiment—Saturday, May 29.
Memorial Day, Sunday, May 30.
Final examinations, Wednesday, June 3 to Thursday, June 10.
Commencement, Tuesday, June 15.
Summer Session, Monday, June 21 to Friday, August 13.
Entrance examinations, Tuesday, June 22 to Saturday, June 26, 8 A. M.

ADMINISTRATIVE OFFICERS

President.....WILLIAM OXLEY THOMPSON
Office: University Hall—99312; N. 476
Residence: University Grounds—2056

Secretary of the Board of Trustees and Business Manager.....CARL E. STEEB
Office: University Hall (East End)—99332; N. 32
Residence: 1956 Iuka Ave.—5835

Registrar, University Editor and Secretary of the University Faculty.....EDITH D. COCKINS
Office: 101 University Hall—99314
Residence: 1348 Neil Ave.—16310

Secretary of the Entrance Board.....LESTER E. WOLFE
Office: 107 University Hall—99353; N. 939
Residence: 1491 Neil Ave.—16507

APPLIED OPTICS

Professor and Director.....CHARLES SHEARD
Office: 206 Physics Building—99324
Residence: 367 West Tenth Ave.—16109

FOREWORD

The primary purpose of this curriculum is to properly and adequately prepare its students to enter the field of optics as applied to the detection and correction of the errors of refraction, accommodation and associated functions of the eyes. To this end the curriculum embodies the following essential and allied branches of instruction: (1) general science and mathematics, (2) the fundamentals of anatomy, histology, physiology and pathology of the human body, (3) special courses on the anatomy and the physiology of the eye, (4) instruction in the detection of pathological and diseased conditions of the eye, and (5) a thorough training in theoretical and practical optics and the application of optical principles to the correction of visual errors, with an adequate provision for clinical practice in both the refractive and pathological fields. Provision is also made for some elective courses, in order that the student may continue any line of instruction previously pursued or select courses which are germane to his work.

ADMISSION

THE ENTRANCE BOARD

The admission of students is in charge of the University Entrance Board, which determines the credits that shall be issued on all entrance examinations and certificates. Correspondence relative to admission should be addressed to Mr. L. E. Wolfe, Secretary of the Entrance Board, Ohio State University, Columbus, Ohio.

ENTRANCE BY DIPLOMA OR EQUIVALENTS

The following persons are eligible to admission without examinations or conditions:

(1) The holder of a diploma from a first-grade high school in the State of Ohio.

(2) The holder of a properly endorsed certificate from such secondary schools as have been accredited or recognized by the University.

(3) The holder of a 60 count Regents' Certificate of the State of New York.

(4) The holder of 15 credit units as determined by the Entrance Board.

ENTRANCE BY EXAMINATION

Deficiencies in requirements for entrance may be removed by examinations given by the University during the months of September and June.

Students over twenty-one years of age may be admitted upon satisfactory evidence that they can successfully pursue the work elected. No degree will be granted unless the full entrance requirements have been fulfilled.

For further information, see the **Bulletin of General Information**, which may be obtained on application to Mr. L. E. Wolfe, Secretary of the Entrance Board.

It is urged that students who desire to enter the University put themselves in communication with the Secretary of the Entrance Board at as early a date as possible.

REGISTRATION

Admission to the University must be secured before registration can be accomplished. Registration consists of the following steps in the order indicated: (1) the securing of a class-card from the Director of the Courses in Applied Optics (office, Physics Building, room 206), (2) the securing of a fee-card from the office of the Registrar, and (3) the payment of the fees at the office of the Bursar.

DEGREE

Upon the satisfactory completion of the four-year curriculum, or what is deemed to be its equivalent, a student will receive the degree of Bachelor of Science in Applied Optics.

EQUIPMENT

The courses are thoroughly equipped with the modern and the best forms of optical apparatus. The clinic is provided with schematic eyes with pathological slides, C. & I. ophthalmometer, Universal ophthalmometer, Hardy ophthalmometer with corneal microscope, several DeZeng phorometers, a Wolff skioptometer with batteries of spheres and cylinders, various pieces of muscle-testing apparatus, several self-luminous retinoscopes and ophthalmoscopes, a Geneva combined retinoscope and ophthalmoscope, a perimeter, a Rogers dioptrometer, interpupillary gauge, vertex dioptrometer, trial cases, Hertel keratometer, Stevens tropometer, Stevens clinoscope and all the best forms of modern ophthalmic apparatus suitable for refractive and ophthalmic lens purposes. The mechanical laboratory is fully equipped to grind, surface, edge and mount ophthalmic lenses.

CLINICAL FACILITIES

Clinics open to the students and members of the instructional force in particular and to outsiders upon application are

conducted every afternoon during the week. These clinics furnish an endless variety of ocular conditions for the inspection and investigation of the students in these courses. Students make the examinations under the supervision of the director of the clinic. These clinics have served between five and six hundred persons each year during the period of their existence. Difficult cases form the basis for a subsequent discussion of methods of examination employed and the interpretation of the data obtained.

FEES AND EXPENSES

All University dues must be paid at the opening of each semester as a condition of admission to classes. Registration is not complete until tuition and certain laboratory fees are paid.

TUITION

First and Second Years. The tuition fee is $15.00 each semester.

Third and Fourth Years. The tuition fee is $50.00 each semester. The total tuition fees for the four years aggregate $260.00.

Special Students or others who take the courses of the third and fourth years, or any portion thereof, shall pay a fee of $50.00 each semester.

Laboratory Deposits. Students are required to pay for all materials consumed in laboratory work during the first and second years. A cash deposit is required in each course requiring such materials; the unexpended balance is returned at the end of the semester.

OTHER EXPENSES

Ohio Union. A fee of one dollar a semester is paid by all male students at registration.

Rooms and Board. Furnished rooms, accommodating two students can be rented at one dollar and a half to two dollars per week for each student. Board at the restaurants and clubs near the University costs from four dollars to four dollars and fifty cents per week. The Ohio Union offers board at reasonable rates.

Books. This item of expense varies in the different years; it will average about thirty dollars per year.

NOTE. A student should come prepared to expend about seventy-five to one hundred dollars during the first ten days of the semester.

INFORMATION

For further information as to entrance requirements, etc., address Mr. L. E. Wolfe, Secretary of the Entrance Board. Correspondence is also invited by Charles Sheard, Professor of Applied Optics, who will be in his office (Physics Building, room 206) from 9 to 11 a. m. September 10 to 17.

CURRICULUM

LEADING TO THE DEGREE, BACHELOR OF SCIENCE IN APPLIED OPTICS

FIRST YEAR

First Semester			Second Semester		
Chemistry (105 or 109) Elementary or General		4	Chemistry (106 or 110) Elementary or General		4
English (101) Description and Narration		2	English (104) Exposition and Argumentation		2
Engineering Drawing (101) Elementary Mechanical		2	Engineering Drawing (102) Mechanical		3
Anatomy (125)		4	Anatomy (126)		4
Anatomy (139) Histology		3	Anatomy (140) Histology		2

SECOND YEAR

Physics (103 or 105) General		4	Physics (104 or 106) General		4
Physiology (127)		3	Physiology (128)		3
Mathematics (121) College Algebra and Trigonometry		3	Mathematics (122) Trigonometry and Analytical Geometry		3
Pathology (129)		3	Bacteriology (150)		4
*Elective		3	*Elective		3

THIRD YEAR

Anatomy (145) The Eye		4	Optics (112) Theoretical Applied Optics		4
Psychology (103) Elementary		2	Psychology (104) Elementary and Experimental		3
Optics (107) Theoretical		4	Optics (108) Theoretical		5
Physiology (161) The Eye		3	Optics (110) Mechanical		1
*Elective		3	*Elective		3

FOURTH YEAR

Optics (129) Mechanical		1	Optics (134) Theoretical Applied Optics		6
Optics (133) Theoretical Applied Optics		6	Pathology (142) The Eye		3
Pathology (141) The Eye		3	Optics (148) Clinical Practice		5
Optics (147) Clinical Practice		3	*Elective		3
*Elective		3			

*All electives shall be subject to the approval of the Professor of Applied Optics

DEPARTMENTS OF INSTRUCTION

ANATOMY

Office, 105 Biological Hall

125. Human Anatomy. Four credit hours. Mr. Buck and assistants.

Osteology, arthrology, syndesmology and myology, exclusive of the lower portions of the body.

126. Human Anatomy. Four credit hours. Mr. Buck and assistants.

Myology, angiology, splanchnology and peripheral nervous system, exclusive of the lower portions of the body.

139. Histology. Three credit hours. First semester. Two recitations or lectures and three laboratory hours each week. Mr. Warren and assistants.

The histology of the tissues, the histology of the organs, with special emphasis laid upon the head and neck regions.

140. Histology. Two credit hours. Second semester. One recitation or lecture, and two laboratory hours each week. Mr. Warren and assistants.

The histology of the tissues, the histology of the organs, with special emphasis laid upon the head and neck regions.

145. Anatomy of the Eye. Four credit hours. Mr. Landacre.

The comparative anatomy of the vertebrate eye and its associated muscles and nerves, including a dissection of the brain and cerebral nerves of the shark and the skull and gross structure of the mammalian eye; the minute structure and embryology of the mammalian eye, including the study of the human skull and eye.

APPLIED OPTICS

Office, 206 Physics Building

107. Theoretical Optics. Four credit hours. Mr. Sheard.

Recitations, lectures and laboratory work on reflections; refraction and refractive indices; prisms; refraction by curved

surfaces; thin lenses and lens calculations; cylinders; transpositions; oblique cylindricals and oblique sphericals. The emphasis is laid on the fundamental principles, with numerous numerical problems.

108. Theoretical Optics. Five credit hours. Mr. Sheard.

Recitations, lectures and laboratory work on ophthalmic prisms; decentration; effectivity and back focal length; equivalence of various forms of ophthalmic lenses; vertex refraction and modern ophthalmic lens theory and practice; thick lenses and combinations; chromatic and spherical aberration; interference; diffraction and polarization.

110. Mechanical Optics. One credit hour. Mr. Sheard and assistants.

Practical work in neutralizing; lens centering; use of abrasives; simple surface and edge grinding and drilling. Lectures on history and manufacture of glass and the composition of various kinds of optical glass.

129. Mechanical Optics. One credit hour. Mr. Sheard and assistants.

Practical work in lens mounting, frame and frameless; simple soldering; face measurements; bridge bending; mountings and clips and the adjustment of spectacles and eye-glasses. Practice in grinding prisms, prisms in combination and in grinding and finishing bi-focal lenses.

112. Theoretical Applied Optics. Four credit hours. Mr. Sheard and lecturers.

The principles of refraction in the human eye based on the laws of conjugate foci, dealing in detail with hyperopia, myopia and astigmatism. Skiametry (static method) and technique in shadow measuring. Skiametry and the subjective method in the correction of refractive errors. Practical work with the schematic eye and the fraction of some selected cases.

133-134. Theoretical Applied Optics. Six credit hours. Mr. Sheard and lecturers.

Recitations, lectures and demonstrations on optical constants of the eye; mathematical and physical methods and calculations applied to the correction of anomolies of the eye; fundamental

concepts in physiological optics; monocular and binocular vision; accommodation; convergence; co-ordination of visual functions; study of selected reports and cases from clinical practice; the relations between radiant energy and the eye.

During the first semester special lectures and demonstrations will be given, involving dynamic skiametry, ophthalmometry and ophthalmoscopy.

During the second semester these special lectures and demonstrations will deal with the stereoscopic aspects of the various correlated visual functions and the value of lenses as economic agencies in binocular vision.

147. Clinical Practice. Three credit hours. Mr. Sheard.

148. Clinical Practice. Five credit hours. Mr. Sheard.

BACTERIOLOGY

Office, 202 Veterinary Laboratory

150. Bacteriology. Four credit hours. Mr. Morrey.

Disinfection and sterilization; the preparation of culture media and a thorough study of the pathogenic bacteria of the oral cavity.

CHEMISTRY

Office, 100 Chemistry Building

105. Elementary Chemistry. Four credit hours. Mr. Evans, Mr. Day, and assistants.

A general course on the chemistry of non-metals arranged for students who have not presented chemistry as an entrance requirement.

106. Elementary Chemistry and Qualitative Analysis. Mr. Evans, Mr. Day, and assistants.

A general course on the chemistry of metals. The laboratory work accompanying is a general introductory course in qualitative analysis.

109. General Chemistry. Four credit hours. Mr. Evans, Mr. Day, and assistants.

A general course on the chemistry of non-metals. It is more advanced than Chemistry 105 and is arranged for students who have an acceptable course in elementary chemistry in a secondary school.

110. General Chemistry and Qualitative Analysis. Mr. Evans, Mr. Day, and assistants.

A general course on the chemistry of the metals. Laboratory work is a general course in qualitative analysis.

ENGINEERING DRAWING

Office, 204 Brown Hall

101. Elementary Mechanical Drawing. Two credit hours. Mr. French and department assistants.

Practice in the use of drawing instruments, elementary projections.

102. Mechanical Drawing. Three credit hours. Mr. French and department assistants.

Lettering, orthographic, isometric and oblique projections.

ENGLISH

Office, 103 Physics Building

101. Paragraph Writing: Description and Narration. Two credit hours. Texts: Scott and Denney's Paragraph Writing, and Duncan, Beck and Graves's Specimens of Prose composition. All instructors.

104. Paragraph Writing: Exposition and Argumentation. Two credit hours. All instructors.

MATHEMATICS

Office, 314 University Hall

121. College Algebra and Trigonometry. Three credit hours. Mr. Swartzel, Mr. Rasor, Mr. Arnold.

122. Plane Trigonometry and Analytical Geometry. Three credit hours. Mr. Swartzel, Mr. Rasor, Mr. Arnold.

PATHOLOGY

Office, 710 North Park Street

129. Pathology. Three credit hours. Mr. Scott.

General pathology, including the etiology of diseases, distribution of nutrition, inflammation and tumors.

141-142. Pathology of the Eye. Three credit hours. The year. Mr. Scott.

A laboratory course covering the gross and histological lesions involving the eye.

PHYSICS

Office, 107 Physics Building

103-104. General Physics. Four credit hours. Mr. Earhart.

A non-mathematical course for students who have no entrance credit in physics.

105-106. General Physics. Four credit hours. Mr. Cole.

PHYSIOLOGY, PHYSIOLOGICAL CHEMISTRY AND PHARMACOLOGY

Office, 104 Biological Hall

127. Physiology. Three credit hours. Mr. McPeek and assistants.

The physiology of unicellular structures, muscle and nerve, central nervous system, autonomic system, external and internal senses, blood and heart. Reports of papers by students.

128. Physiology. Three credit hours. Mr. McPeek and assistants.

The physiology of the circulatory and respiratory mechanisms, digestion, excretion, metabolism, etc.

161. Physiology of the Eye. Three credit hours. Mr. McPeek.

PSYCHOLOGY

Office, 403 University Hall

103-104. Elementary Psychology. Two credit hours. Mr. Arps.

111. Experimental Psychology: Introduction. Three credit hours. Mr. Arps.

Topics: The sense fields, geometrical optical illusions, stereoscopic and pseudoscopic illusions, tactual space perception, auditory localization, attention, reaction-time, memory types, tonal fusion, association and analysis of judgment.

The Ohio State University Bulletin is issued at least twenty times during the year; monthly in June, July, August, and September, and bi-weekly in October, November, December, January, February, March, April, and May.